

SENTINEL™
YOUR KEY TO NDT

PRODUCT CATALOG

GAMMA RADIOGRAPHY DIGITAL RADIOGRAPHY LIQUID PENETRANT INSPECTION

MAGNETIC PARTICLE INSPECTION ULTRASONIC INSPECTION X-RAY INSPECTION



www.SENTINELNDT.com

SELENIUM-75 IRIDIUM-192 COBALT-60 YTTERBIUM-109

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INTRODUCTION

SENTINEL™, based at the QSA Global, Inc. facility in Burlington, MA., has a worldwide reputation for quality, reliability and safety. We are committed to exceeding the expectations of NDT professionals who demand outstanding value for their money by providing them with the very best equipment and supplies.



We offer a comprehensive range of NDT equipment and accessories, including gamma radiography projectors, x-ray equipment, liquid penetrant and magnetic particle inspection materials. SENTINEL™ also offers a wide variety of safety equipment, training courses and services.

In addition to equipment, SENTINEL™ produces a complete range of radiography sources (Iridium-192, Cobalt-60, Selenium-75 and Ytterbium-169) as well as source holders that are fully compatible with all leading makes of projector.

The SENTINEL™ Quality Management system is approved to ISO 9001 and US NRC Part 71 standards, and is matched by our commitment to provide our customers with exceptional products and service.

Product inspection, routine maintenance and repairs are available on-site or from our worldwide network of SENTINEL™ distributors, to ensure our standards of Quality and Safety Assurance always apply.

This catalog provides details of NDT equipment, accessories and related products currently available. Information about new products and improvements to existing products will be sent to you on a continuing basis. Your SENTINEL™ representative will be pleased to assist you in keeping your catalog updated.

SENTINEL™
YOUR KEY TO NDT

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GAMMA RAY PROJECTORS

880 Delta

Item No. 880DELTA

880 Sigma

Item No. 880SIGMA

880 Elite

Item No. 880ELITE

880 Omega

Item No. 880OMEGA

880 Series Source Projectors

Model 880 series source projectors are used for industrial applications of gamma radiography to inspect materials and structures in the density range of approximately 2.71 g/cm³ through 8.53 g/cm³.

SENTINEL™ Model 880 Delta, 880 Sigma, 880 Elite, and 880 Omega source projectors are portable, lightweight and compact industrial radiographic exposure devices. The patented device body consists of a titanium 'S' tube and cast depleted uranium (DU) shield contained within a 300 series stainless steel tube with stainless steel discs welded at each end forming a cylinder shaped housing. The discs are recessed to provide protection for the rear mounted locking mechanism and front mounted outlet port.

The horizontally oriented design allows the locking mechanism, source assembly connector and outlet port to be easily operated, simplifying connection of source guide tubes and remote controls.

880 Patent Numbers

United States 6781114
Europe 1325501B

Canada 2425905 (Pending)
Korea 10-2002-700482 (Pending App. No.)

Jacket Patent Numbers

United States D453570S



880 OMEGA

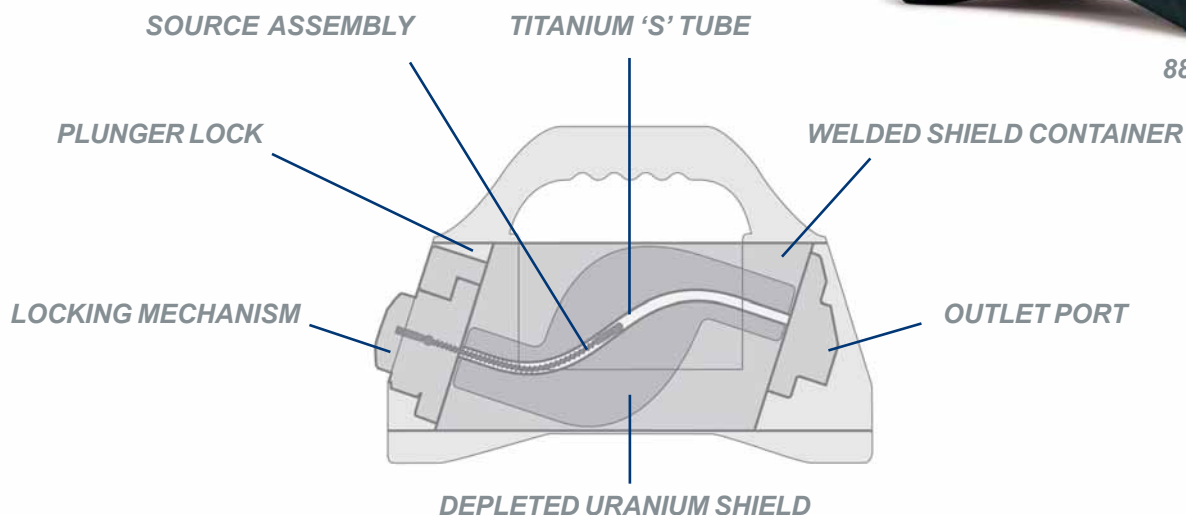


880 ELITE

880 DELTA



880 SIGMA



GAMMA RAY PROJECTORS

880 Series Source Projectors

EXPOSURE DEVICE

The exposure device body, containing the DU shield, locking mechanism, outlet port, protective covers and required labels*, comprises the radioactive material transport Type B(U) package. The 880 Omega is not Type B(U) approved, but is Type A approved.

WELDED MAIN BODY HOUSES THE SOURCE ASSEMBLY INSIDE A TITANIUM 'S' TUBE

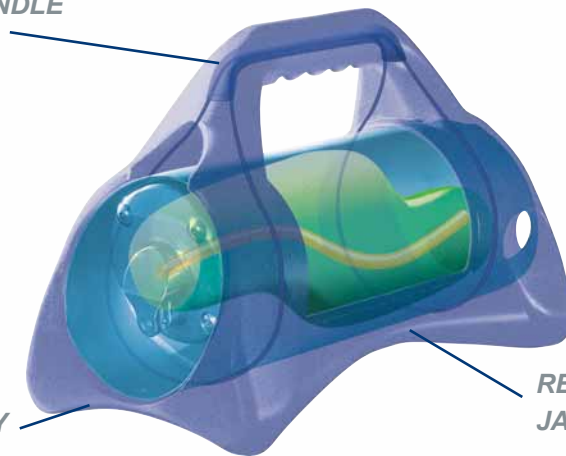


EXPOSURE DEVICE IS COMPLIANT WITH TYPE B PACKAGE EVEN IF JACKET IS REMOVED

REMOVABLE JACKET

An impact resistant plastic jacket surrounds the exposure device to protect labels and provide the means for carrying and placement during radiographic operations. The four models are identified by jacket color; yellow for the 880 Delta, black for the 880 Sigma, blue for the 880 Elite, and safety orange for the 880 Omega.

COMFORTABLE CARRYING HANDLE



SHAPED BASE AND FEET, AND LOW CENTER OF GRAVITY

RESILIENT ONE-PIECE PLASTIC JACKET

DEVICE/SOURCE MAXIMUM CAPACITY

DEVICE	YTTERBIUM-169		SELENIUM-75		IRIDIUM-192		COBALT-60	
880 Delta	20Ci	0.74TBq	150Ci	5.55TBq	150Ci	5.55TBq	65mCi	2.40GBq
880 Sigma	20Ci	0.74TBq	150Ci	5.55TBq	130Ci	4.81TBq	25mCi	925MBq
880 Elite	20Ci	0.74TBq	150Ci	5.55TBq	50Ci	1.85TBq	25mCi	925MBq
880 Omega	30Ci	1.11TBq	80Ci	2.93TBq	15Ci	0.55TBq	N/A	

*Multilingual labeling is available upon request.

GAMMA RAY PROJECTORS

979 Crawler Head



The Model 979 crawler head is exclusively designed for use with gamma radiography crawlers containing a Selenium-75 source. It is compatible with (gamma crawler specific) mechanical and electromechanical actuators.

Self propelled pipeline crawlers are inserted into pipelines with inner diameters of 3 in (7.62 cm) or greater to perform panoramic radiography of circumferential welds and the adjacent heat affected areas.

The exposure device consists of a welded stainless steel housing which contains a tungsten shield. It also serves as part of the Type A storage and transport packaging for the radioactive source. The beam port contains lead to shape the emergent primary beam when the source assembly is in the exposure mode.

Item No. 97900

FEATURES

- Reusable
- Key-lockable storage cover
- Safety
- Stainless steel housing
- Panoramic beam with a variable width of 5° to 90°

EXPOSURE DEVICE

DIMENSIONS			SOURCE CAPACITY
Length	7.5 in	(19.5 cm)	12Ci (444GBq), Selenium-75
Diameter	2.5 in	(6.5 cm)	
Mass	9.6-13.9 lb	(4.4 kg)	

SHIELDING

MATERIAL	MASS	
Tungsten	5.8 lb	(2.6 kg)
Lead		

GAMMA RAY PROJECTORS

959M Scar Projector

The Model 959M portable gamma radiographic exposure device is specifically designed as a Small Controlled Area Radiography (SCAR) system. The SCAR projector is used primarily for the radiography of standard or difficult joint geometries without disruption and the need for large barrier areas.

The SCAR system is comprised of a Model 959M projector, a pneumatic control unit and a series of clamps to fit a variety of pipe sizes.

The system may be used with a maximum of 15 curies of Iridium-192 or 81 curies of Selenium-75. Lower activity sources with smaller focals are available.

Item No. TEN95940M

Pipe Fixture Rod Kit for the 959 Projector

Item No. 95999

FEATURES

- Allows for 24 Hour radiography
- Highly directional beam
- Reduces radiation dose
- Sealed source does not leave the device during exposures
- No flash dose during exposure or retraction of sealed source
- More production time for all trades
- Locks to prevent unauthorized operation
- Inspection through insulation for corrosion



EXPOSURE DEVICE

LENGTH		DIAMETER		MASS		SOURCE CAPACITY
11 in	(28.0 cm)	4.50 in	(11.4 cm)	41 lb	(18.6 kg)	15Ci (555GBq), Iridium-192
						81Ci (3TBq), Selenium-75

CONTROL CONSOLE

LENGTH		DIAMETER		HEIGHT		MASS
10.75 in	(2.73 cm)	8.75 in	(2.22 cm)	8.5 in	(21.6 cm)	8.5 lb (3.9 kg)

GAMMA RAY PROJECTORS

680B Projector with OPL



The SENTINEL™ Model 680B source projector combines the penetrating radiation of Cobalt-60 with the mobility provided by the use of depleted uranium shielding. It is designed for the radiography of steel from 1 in to 7 in (25 mm to 175 mm) thick and light alloys 3 in to 15 in (75 mm to 375 mm) thick. All components have been developed to provide safe, reliable service and long life under the harsh conditions of industrial use. The durable case is designed to ease rigging operations.

A lock is incorporated to prevent use by unauthorized personnel. The source cannot be projected until the control cable is correctly connected. The projector can not be locked or the control cable disconnected until the source is safely stored. Projectors with codes that include the letter A or B are fitted with the unique Posilock device which automatically secures the source assembly in the stored position on retraction.

Remote controls allow the operator to control the source at a distances of 35 ft (10.7 m) or 50 ft (15.2 m). When the source is in the exposure position the control can be a total distance of 46 ft (14 m) using 25 ft controls, 63 ft (19.2 m) using 35 ft controls, or 99 ft (30 m) using 50 ft controls.

Item No. TENB680

EXPOSURE DEVICE

DIMENSIONS			SOURCE CAPACITY
Length	21 in	(53 cm)	110Ci (4.07TBq), Cobalt-60
Width	14-3/4 in	(38 cm)	
Height	12 in	(30 cm)	
Mass	465 lb	(211 kg)	

SHIELDING

MATERIAL	MASS	
Depleted Uranium	302 lb	(137 kg)

GAMMA RAY PROJECTORS

Accessories



660 SERIES TYPE B(U) TRANSPORT PACKAGE

The 660 Overpack (OPL-660) is used for safe transport of the 660 series gamma ray projectors with an Iridium-192 source. The overpack consists of a welded steel case fitted with rigid foam and wood inserts to secure the 660.

- Welded steel construction
- Removable cover
- Maximum capacity: 140Ci, Iridium-192
- 18-1/2 in (L) x 8-1/4 in (W) x 14-1/2 in (H)
(47 cm (L) x 21 cm (W) x 36-5/6 cm (H))
- 88 lbs

Item No. 66060-1

660 SERIES FLOOR MOUNT SECURING FRAME

The 660 Floor Mount secures the 660B gamma ray projector and overpack to the dark room floor.

- Welded stainless steel construction
- 9-3/4 in (L) x 8-3/8 in (W) x 6-3/4 in (H)
(24-3/4 cm (L) x 21-1/3 cm (W) x 17-1/8 cm (H))
- 5 lbs

Item No. FM-98-SS



SOURCES & SOURCE HOLDERS

Sources

The SENTINEL™ range of double encapsulated special form sealed source assemblies caters to most industrial applications using gamma radiography.

A choice of isotopes provides solutions for the widely varying requirements demanded by different materials and site conditions. Sources with outputs ranging from less than one curie up to several hundred are available—all precision constructed to ensure the highest possible specific activities and the smallest focal spot sizes.

Source exchange is available as a service either on-site or when source projectors are returned to SENTINEL™ for inspection or overhaul. Sources can be shipped in the source projector or in a suitable returnable transport container.

SELENIUM-75

Selenium-75 sources are available in cylindrical and quasi-spherical focals, permitting shorter SFDs and greater sensitivity on fixed geometries.

IRIDIUM-192

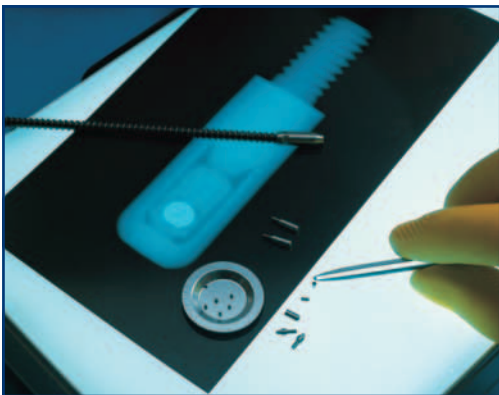
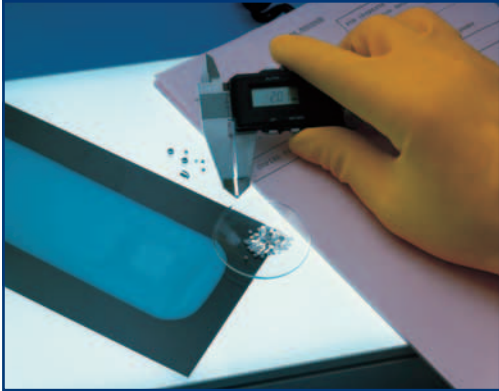
Iridium-192 sources are constructed using iridium metal discs or pellets of uniform size in a welded stainless steel capsule.

COBALT-60

Cobalt-60 sources are constructed using compression fused cobalt metal pellets confined within welded titanium and stainless steel capsules.

YTTERBIUM-169

Ytterbium-169 sources are available in spherical and right circular cylinder focals, housed in a welded titanium alloy capsule.



SOURCES & SOURCE HOLDERS

Sources

ENERGY SPECTRUM AND STEEL WORKING RANGE

ISOTOPE*	SOURCE MODEL	HALF LIFE	ENERGIES	STEEL WORKING RANGE
Selenium-75	A424-25W	120 Days	97-401 KeV	.32 in to 1.18 in (8 mm to 30 mm)
Iridium-192	A424-9	74 Days	206-612 KeV	.47 in to 2.76 in (12 mm to 70 mm)
Cobalt-60	A424-13, A424-14, A424-18	5.27 Years	1.17-1.33 MeV	1.97 in to >4.72 in (50 mm to >120 mm)
Ytterbium-169	918	32 Days	63-308 KeV	.16 in to .79 in (4 mm to 20 mm)

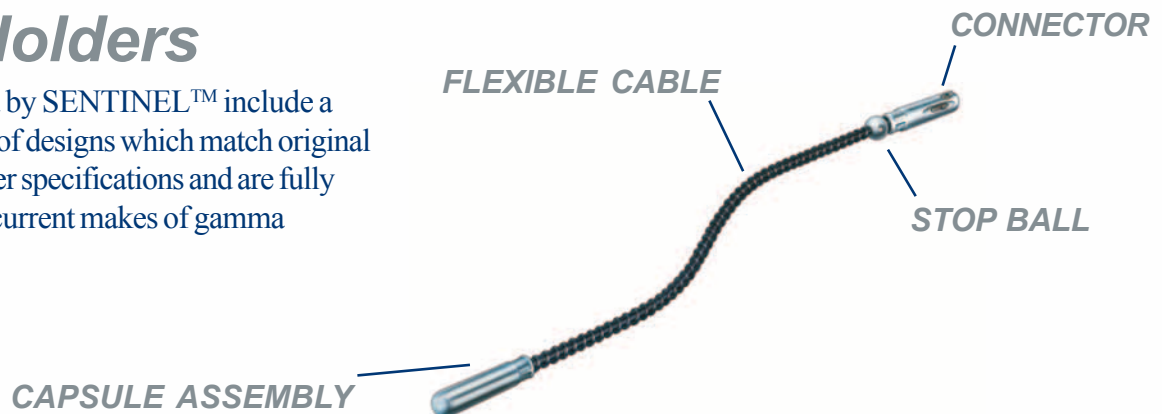
DEVICE/SOURCE MAXIMUM CAPACITY

SENTINEL DEVICE	SELENIUM-75	IRIDIUM-192	COBALT-60	YTTERBIUM-169	
880 Delta	150 Ci (5.55 TBq)	150 Ci (5.55 TBq)	65 mCi (2.40 GBq)	20 Ci (0.74 TBq)	
880 Sigma	150 Ci (5.55 TBq)	130 Ci (4.81 TBq)	25 mCi (925 MBq)	20 Ci (0.74 TBq)	
880 Elite	150 Ci (5.55 TBq)	50 Ci (1.85 TBq)	25 mCi (925 MBq)	20 Ci (0.74 TBq)	
880 Omega	80 Ci (2.93 TBq)	15 Ci (0.55 TBq)	N/A	30 Ci (1.11 TBq)	
979 Crawler Head	12 Ci (444 GBq)				
959M SCAR Projector	81 Ci (3 TBq)	15 Ci (555 GBq)			
989 SCAR Projector	20 Ci (740 GBq)				
865 Projector		240 Ci (8.88 TBq)			
741 A/B Projector			33 Ci (1.22 TBq)		
680 A/B Projector			110 Ci (4.07 TBq)		
676 A/B Projector			330 Ci (12.32 TBq)		
660 A Projector	81 Ci (3 TBq)	120 Ci (4.44 TBq)			
660 B Projector	81 Ci (3 TBq)	140 Ci (5.18 TBq)			
OTHER DEVICE	SOURCE MODEL#	SELENIUM-75	IRIDIUM-192	COBALT-60	YTTERBIUM-169
INC-IR100	# 87703		120 Ci (4.44 TBq)		
SPEC-150	# 969		150 Ci (5.55 TBq)		

*Selenium-75 and Iridium-192 use the 650L Source Changer, while Cobalt-60 uses the 770 Source Changer.

Source Holders

Source holders offered by SENTINEL™ include a comprehensive choice of designs which match original equipment manufacturer specifications and are fully compatible with most current makes of gamma radiography projector.



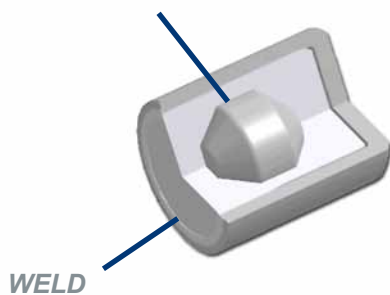
SOURCES & SOURCE HOLDERS

Selenium-75

Selenium-75 sources are available in cylindrical and quasi-spherical focals, permitting shorter SFDs and greater sensitivity on fixed geometries.

- Ideal for controlling the size of the exclusion zone during radiographic exposures at congested work sites
- Optimizes image contrast on radiographic films while lower energy photons provide a better response on storage phosphor plates
- Provides the needed accessibility in fabrications that x-ray generators cannot access

SELENIUM-75 METAL SELENIDE PELLET IN VANADIUM INNER CAPSULE



TECHNICAL SPECIFICATIONS

PELLET DIAMETER	MAXIMUM FOCAL SIZES	NOMINAL ACTIVITIES
1 mm*	1.4 mm*	4 Ci (148 GBq)
1.4 mm*	1.9 mm*	8 Ci (296 GBq)
2 mm	2.2 mm	20 Ci (740 GBq)
2.5 mm	2.7 mm	40 Ci (1.48 TBq)
2.85 mm	3.1 mm	60 Ci (2.22 TBq)
3.25 mm	3.5 mm	80 Ci (3.00 TBq)

HALF VALUE AND THICKNESS VALUE LAYERS

METAL	HVL	TVL
Aluminum	27 mm	80 mm
Steel	8 mm	27.5 mm
Lead	1 mm	4.75 mm
Tungsten	.8 mm	4 mm
Concrete	30 mm	90 mm

APPLICATIONS

- Off shore oil rigs and outages at power generation plants where exposure to non-occupational workers (members of the public) is a problem
- Self propelled pipeline crawlers (QSA Global, Inc. Model 979) and directional beam exposure devices used to perform panoramic exposures of pipelines with inner diameters down to three inches (77 mm)

QUASI-SPHERICAL FOCAL

The active focal of the sources are octagon shaped in the range of 1.4 mm to 3.5 mm (maximum focal) to maximize the output in all directions of use while minimizing the focal spot size.

Sources are available in cylindrical and quasi-spherical focals. Compared to a right circular cylinder focal, the unique focal (quasi-spherical) of the Se-75 permits shorter SFDs and greater sensitivity on fixed geometries.

Testing of the metallic selenide sources demonstrates a high degree of thermal safety and material stability.

*Right circular cylinder focal

CONTROL UNITS & ACCESSORIES



Control Units

A control unit is comprised of the hand crank and gearbox, a pair of control housings, a teleflex drive cable and a safety connector assembly.

CONTROL UNITS & COMPONENTS

DESCRIPTION	SIZE	ITEM NO.	SENTINEL™ BLUE
Handle Grip Control Unit	25 ft (7.5 m)	TAN69225	KRC1-25R
	35 ft (10.5 m)	TAN69235	
	50 ft (15 m)	TAN69250	
Handle Grip Control Unit with Odometer	25 ft (7.5 m)	TAN69325	
	35 ft (10.5 m)	TAN69335	
	50 ft (15 m)	TAN69350	
Reel Type Control Unit with Odometer	25 ft (7.5 m)	TAN66425	KRC1-25REEL
	35 ft (10.5 m)	TAN66435	
	50 ft (15 m)	TAN66450	
Land Based Control Box for 865/959M/989 Projector		86550	
Source Expose Hose for 865/959M/989 Projector		86509-6	
Source Return Hose for 865 Projector		86509-7	
Control Housing-Assembled Pair	25 ft (7.5 m)	59181-25	
	35 ft (10.5 m)	59181-35	
	50 ft (15 m)	59181-50	
Drive Cable Assembly with Connector	50 ft (15 m)	55005	
	70 ft (21 m)	55010	
	100 ft (30 m)	55009	
Handle Grip Control Assembly		69201	
Handle Grip Control Assembly with Odometer		69301	
Reel Type Control Assembly with Odometer		66402	
661 Safety Connector Assembly		66103	
Control Cable Lock and Fitting Kit		TAN766	

Automatic Exposure Control Unit

The fully automatic motorized wind out system enables radiographers to position a source to expose a radiograph and then retract the source after a pre-set exposure time has elapsed. The system can be used with Cobalt-60 units as well as SENTINEL™ Model 660 and 880 devices.

Item No. GAMMASAFE



EXTREME CONDITION CONTROL ASSEMBLY



Handle Control Assembly

A handle control assembly is comprised of the hand crank and gear box, a pair of control housings, a drive cable and a safety connector. The handle grip consists of a light weight housing and hand crank to propel the source to the exposure position and back. The molded handle is specifically designed to maximize crank speed and minimize fatigue. The control housing assembly consists of an outer sheath of flexible cable with a yellow and black cover. The drive cable consists of spiral wound flexible steel.

Applications

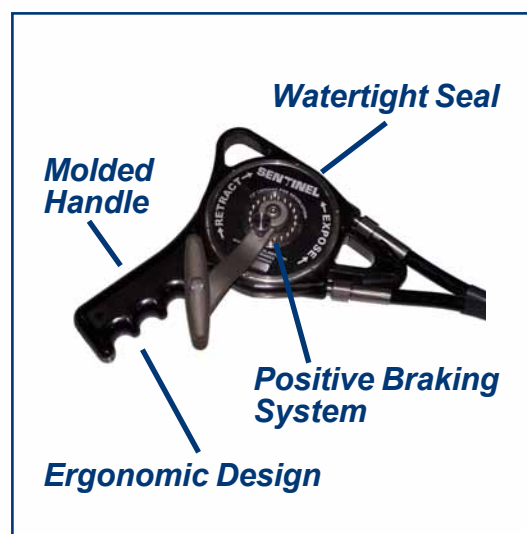
Designed to be used with the SENTINEL™ 880 Series Source Projectors as well as the 660 and 680B Gamma Ray Projectors.

Features

- Available in 25, 35 and 50 ft (7.5, 10.5 and 15 m)
- Light weight polyurethane ergonomic handle design
- Water resistant handle assembly preventing ingress of water, dirt and sand
- Control housings are constructed of light weight, nonmetallic 3-ply material twined together for maximum dent resistance
- Yellow and black housings for high visibility during night operations
- Large gear ratio providing one foot of travel per revolution (ALARA)
- Commercial grade sealed ball bearing
- Noncorrosive stainless steel end fittings
- Extreme temperature operation from -40° F to 212° F (-40° C to 100° C)

CONTROL UNITS & COMPONENTS

DESCRIPTION	SIZE	ITEM NO.
Extreme Condition	25 ft (7.5 m)	SAN88225
Handle Grip Control Unit	35 ft (10.5 m)	SAN88235
	50 ft (15 m)	SAN88250
Extreme Condition	25 ft (7.5 m)	SAN88225R
Reverse Handle Grip	35 ft (10.5 m)	SAN88235R
Control Unit	50 ft (15 m)	SAN88250R
Extreme Condition	25 ft (7.5 m)	95034-25
Control Housing-Assembled Pair	35 ft (10.5 m)	95034-35
	50 ft (15 m)	95034-50
Drive Cable Assembly with Connector	50 ft (15 m)	55005
	70 ft (21 m)	55010
	100 ft (30 m)	55009
Extreme Condition Handle Grip Assembly		95002
661 Safety Connector Assembly		66103



Designed, tested and manufactured to meet the requirements of ANSI N432-1980 and ISO 3999-1 2000E

SOURCE GUIDE TUBES & STOPS

Source Guide Tubes

Source guide tubes are flexible stainless steel tubes with a protective polyvinyl covering and are available to fit all SENTINEL™ projector units.

Intermediate and termination source guide tubes, which are interconnectable to provide required length, are available. The intermediate section tube has a male connector at one end and a female connector at the other, and can be used with a disconnectable source stop as a guide tube termination.

The extreme condition source guide tube is designed for use in extreme weather conditions. It has a temperature range of -60° to 135° C (-76° to 275° F).

EXTREME CONDITION SOURCE GUIDE TUBE



STANDARD SOURCE GUIDE TUBE



SOURCE GUIDE TUBES & STOPS

DESCRIPTION	PROJECTOR	SIZE	ITEM NO.
Source Guide Tube with Fixed Stop	660, 680, 741, 880	7 ft (2.1 m)	TAN48906
	676 Only	7 ft (2.1 m)	TAN67606
Source Guide Tube Extension	660, 680, 741, 880	7 ft (2.1 m)	TAN48907
	676 Only	7 ft (2.1 m)	TAN90203
Extreme Condition Source Guide Tube with Fixed Stop	660, 680, 741, 880	7 ft (2.1 m)	95020
Extreme Condition Source Guide Tube Extension	660, 680, 741, 880	7 ft (2.1 m)	95021
Source Guide Tube Swivel Adaptor (Enables the 660 Guide Tube to be used with the 880 Projector)	880		88081
Removable Source Stop for Guide Tube Extension			TAN691

Custom lengths are available for guide tubes and source stops upon request.

POSITIONING DEVICES

CLAMP HOLDER



POSITIONING CLAMP



TRIPOD STAND

Source Positioning Kit

It is recommended that a source stop be held in position with the source positioning kit. The kit is comprised of a tripod stand, adjustable clamp, and clamp holder.

Tripod Stand, Positioning clamp, and Clamp holder
(Complete Kit)

Item No. TAN4021

Positioning Clamp
Item No. 40201-7

Clamp Holder
Item No. 40201-8

Cast Iron Tripod Base
Item No. 40201-9

Tripod Rod
Item No. 40201-9A

Pipe Centering Devices

These devices are designed to hold a radiography source in the center of pipes or other cylindrical vessels, and are especially useful where panoramic radiographs are needed.



J-TUBE ASSEMBLY

Spring loaded wheel and slide types are available to maintain the source stop in the center of the pipe and yet pass freely over the welds. Used with rigid source tubes the devices can be pushed easily along distances up to the limit of the source projector. They are available with threaded fittings on both ends (compatible with the guide tubes), or the standard male thread at one end and an integral source stop on the other. The standard length is 7 feet. Other lengths are available upon request.

PIPE CENTERING DEVICES & J-TUBES

DESCRIPTION	SIZE	ITEM NO.
Wheel	6 in to 12 in (152 mm to 305 mm)	TAN731
	12 in to 24 in (305 mm to 610 mm)	TAN732
	24 in to 48 in (610 mm to 1210 mm)	TAN733
Slide	1 in to 2 in (25 mm to 51 mm)	TAN7341
	2 in to 4 in (51 mm to 102 mm)	TAN7342
	4 in to 6 in (102 mm to 152 mm)	TAN7343
J-Tube Assembly		91500



SLIDE TYPE
CENTERING DEVICE

GAMMA RAY COLLIMATORS

Collimators contain and direct the beam of radiation during exposure. A wide range of collimators have been developed to meet the variety of applications and techniques used.

COLLIMATORS

DESCRIPTION	WEIGHT	BEAM SIZE	ATTENUATION	HALF VALUE LAYERS	ITEM NO.
Tungsten	1.75 lb (0.79 kg)	60° conical, side throw	Ir-192: 0.05 Co-60: 0.46	Ir-192: 4.30 Co-60: 1.12	TCN799
	4.3 lb (1.95 kg)	60° conical, side throw	Ir-192: 0.009 Co-60: 0.26	Ir-192: 6.80 Co-60: 1.90	TCN827
	9.5 lb (4.32 kg)	60° conical, side throw	Ir-192: 0.003 Co-60: 0.17	Ir-192: 8.30 Co-60: 2.50	TCN828
	4.3 lb (1.95 kg)	20° x 360° panoramic	Ir-192: 0.0045 Co-60: 0.18	Ir-192: 7.80 Co-60: 2.40	TCN846
Lead	3 lb (1.36 kg)	60° conical, side throw	Ir-192: 0.014 Co-60: 0.32	Ir-192: 6.20 Co-60: 1.70	TCN714
Large Lead Collimator	3 lb (1.36 kg)	60° conical, side throw	Ir-192: 0.014	Ir-192: 6.20	TCN717



DARK ROOMS & EQUIPMENT

Film Illuminators



SENTINEL™ ILLUMINATOR

- Stainless Steel
- AC 110v/50/60Hz
- 650W
- On/off foot switch
- 4-1/2 in x 17 in viewing area
- Meets ASTM Standard E-1390-06

Item No. DF-2D5S-S2



HIGH INTENSITY ILLUMINATOR

- AC 120v/60Hz
- 1000 watts of brightness
- On/off foot switch
- 4-1/2 in x 17 in viewing area
- Stainless Steel

Item No. QME1001

FILM VIEWER BULBS

DESCRIPTION		ITEM NO.
Photoflood #1	BBA Small	9160900291
Photoflood #2	EBV Large	9160930291
SENTINEL™ Bulb	Fluorescent Bulb	FT55DL/841



187A HIGH INTENSITY ILLUMINATOR

- Designed for industrial radiography
- 1000 watts of brightness
- Electronic brightness control
- On/off foot switch
- Set of 4 steel masks
- 24 in (W) x 10 in (H) x 10 in (D)
(60.96 cm (W) x 25.4 cm (H) x 25.4 cm (D))

Item No. TO-1001

185 HIGH INTENSITY ILLUMINATOR

- Ideal for reading industrial film
- 6" diameter superbright viewing area
- Electronic brightness control
- On/off foot switch
- Set of steel masks
- 9 in (W) x 18 in (H) x 14 in (D)
(22.86 cm (W) x 45.72 cm (H) x 35.56 (D))

Item No. 9160931289

188 BRIGHT SPOT ILLUMINATOR

- Variable intensity illumination
- Rheostat foot switch
- Swivel base
- Adjustable lamp housing
- 6 in (W) x 7.5 (H) x 6.75 (D)
(15.24 cm (W) x 19.05 cm (H) x 17.15 cm (D))

Item No. 9160932289

DARK ROOMS & EQUIPMENT

Dark Rooms



FEATURES

- Fiberglass construction
 - Wood frame
 - Insulated roof and walls
 - Five to eight 115v AC outlets
 - 12v DC outlet
- 6 ft (1.83 m) Dark Room
Item No. DKRM-C6
 8 ft (2.44 m) Dark Room
Item No. DKRM-C8
 8 ft (2.44 m) Dark Room with
 Generator
Item No. DKRM-C8R
 Developing Tank

Film Processing Accessories



TIMER

- Bell timer
 - Luminescent dial
- Item No. 9143920002**



DIGITAL TIMER

Digital stop watch, 0-99 min
Item No. S90861



FILM DEVELOPING REELS

70 mm plastic reel
Item No. 9145920005
 90 mm plastic reel
Item No. 9145920008



SOLUTION AGITATOR

Stainless steel solution agitator
Item No. 9129330101



IMMERSION HEATERS

306 with thermostat
Item No. 9155910001
 3150SS without thermostat
Item No. 9155910003

DARK ROOMS & EQUIPMENT

Film Processing Accessories



FLOATING GLASS THERMOMETER

Calibrated from 40° to 120° F

Item No. TO-5010



DIAL THERMOMETER

Range: 0° to 140° F

-20° to 60° C

Item No. 9148020201



COMPARATORS

5 Reticles

Item No. 9161990096

1 Reticle

Item No. TO-F800



HIGH VISION SAFELIGHT

•More usable light in the safe range

•Reusable filter

•21.5 in (W) x 1.5 in (H) x 3.75 in (D)

(54.6 cm (W) x 3.8 cm (H) x 9.5 cm (D))

Hi-vision safelight (20w)

Item No. 9142300401

Hi-vision safelight (15w)

Item No. 9142300402

Safelight 24 in (60.96 cm) Bulb

Item No. 9142300472

Safelight 18 in (45.72 cm) Bulb

Item No. 9142300471



DARK ROOM SAFELIGHT

•15 watt lamp

•Can be mounted on a wall or hung from a ceiling

•Plexiglas filter

•5 in (W) x 7 in (H)

(12.7 cm (W) x 17.78 cm (H))

Item No. SL5-R

DARK ROOMS & EQUIPMENT

Film Processing Accessories



SM-10T DENSITOMETER

The SM-10T densitometer assures instant, accurate, and repeatable results.

- Accurate
- No warm up time
- Extended battery life
- Range: 0 to 5.0 D
- Aperture: 2 mm
- Weight: 2.5 lb

Item No. TO-SM-10



ID PRINTERS

- Variable time exposures
- Table top or recessed units
- Stainless steel door & template
- Standard model 143

Item No. 9149201010

Automatic model 144

Item No. 9149202010



POCKET PAL DENSITOMETER

This instrument is accurate to $\pm .02$ from 0.00 to 4.00 Optical Density.

- Portable
- Battery operated
- Range: 0 to 4.0 D
- Aperture: 3 mm
- Weight: 5.9 oz

SM-12 Densitometer

Item No. TO-SM-12

SM-14 Densitometer

Item No. TO-SM-14



DENSITY COMPARISON STRIP

5 Step Density Strip

Item No. 5099

21 Step Density Strip

Item No. 5004

DARK ROOMS & EQUIPMENT

Film Processing Accessories



MARKERS

DESCRIPTION	ITEM NO.
Mean-Streak Marker, White	MRK001
Mean-Streak Marker, Yellow	MRK005
Uni-Paint Marker, White	MRK002
Uni-Paint Marker, Yellow	MRK003
Uni-Paint Marker, Red	MRK009
China Marker, White	MRK004
China Marker, Yellow	MRK006
China Marker, Red	MRK010
Nissen Marker Felt Tip, White	MRK007
Nissen Marker Felt Tip, Yellow	MRK008



FILM DEVELOPING HANGERS

SIZE	ITEM NO.
4.5 in x 10 in (11.43 cm x 25.4 cm)	DH45X10
8 in x 10 in (20.32 cm x 25.4 cm)	DH8X10
3.5 in x 17 in (8.89 cm x 43.18 cm)	DH35X17
4.5 in x 17 in (11.43 cm x 43.18 cm)	DH45X17
14 in x 17 in (35.56 cm x 43.18 cm)	DH14X17

Other sizes may be available upon request.

FILM FILING ENVELOPES

SIZE	ITEM NO.
4.5 in x 10 in (11.43 cm x 25.4 cm)	9163110162
4.5 in x 17 in (36.83 cm x 43.18 cm)	9163110158
5 in x 7 in (12.7 cm x 17.78 cm)	TO-1054
8 in x 10 in (20.32 cm x 25.4 cm)	TO-1055
7 in x 17 in (17.78 cm x 43.18 cm)	9163110144
14 in x 17 in (35.56 cm x 43.18 cm)	TO-1059

PRINTED ENVELOPES

4.5 in x 10 in (11.43 cm x 25.4 cm)	ENV001
4.5 in x 17 in (36.83 cm x 43.18 cm)	ENV002



DARK ROOMS & EQUIPMENT

Exposure Accessories



LEAD SCREENS

- Reduces scattered radiation
- Intensifies image
- Available in two thicknesses
- Available in rolls and all popular sheet sizes
- Available with plastic backing

LEAD SCREENS

DESCRIPTION	SIZE	ITEM NO. (.005")	ITEM NO. (.010")
Lead Screen Roll	2.76 in x 300 ft (70 mm x 91.44 m)	4547011001	
	2.76 in x 180 ft (70 mm x 54.86 m)		4547011003
	3.54 in x 300 ft (90 mm x 91.44 m)	4547011005	
	3.54 in x 180 ft (90 mm x 54.86 m)		4547011007
	4.5 in x 300 ft (11.43 cm x 91.44 m)	4547011009	
	4.5 in x 180 ft (11.43 cm x 54.86 m)		4547011011
	17 in x 95 ft (43.18 cm x 28.96 m)	4547011002	
	17 in x 45 ft (43.18 cm x 13.72 m)		4547011004
Lead Screen Sheet	4.5 in x 10 in (11.43 cm x 25.40 cm)	8011004205	8011004206
	4.5 in x 17 in (11.43 cm x 43.18 cm)	8011004207	8011004208
	8 in x 10 in (20.32 cm x 25.40 cm)	8011004213	8011004214
	14 in x 17 in (35.56 cm x 43.18 cm)	8011004219	8011004220

LEAD SCREENS WITH PLASTIC BACKING

DESCRIPTION	SIZE	ITEM NO. (.005")	ITEM NO. (.010")
Lead Screen Roll	2.76 in x 300 ft (70 mm x 91.44 m)	LSPB70X300	
	2.76 in x 180 ft (70 mm x 54.86 m)		LSPB70X180
	3.54 in x 300 ft (90 mm x 91.44 m)	LSPB35X300	
	3.54 in x 180 ft (90 mm x 54.86 m)		LSPB35X180
	4.5 in x 300 ft (11.43 cm x 91.44 m)	LSPB45X300	
	4.5 in x 180 ft (11.43 cm x 54.86 m)		LSPB45X180
	17 in x 95 ft (43.18 cm x 28.96 m)	LSPB17X95	
	17 in x 54 ft (43.18 cm x 16.46 m)		LSPB17X54
Lead Screen Sheet	4.5 in x 10 in (11.43 cm x 25.40 cm)	LSPB45X1005	LSPB45X1010
	4.5 in x 17 in (11.43 cm x 43.18 cm)	LSPB45X1705	LSPB45X1710
	8 in x 10 in (20.32 cm x 25.40 cm)	LSPB8X1005	LSPB8X1010
	14 in x 17 in (35.56 cm x 43.18 cm)	LSPB14X1705	LSPB14X1710

DARK ROOMS & EQUIPMENT

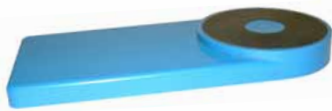
Exposure Accessories



LEAD LETTERS & FIGURES



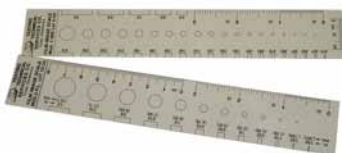
MAGNETIC FILM HOLDER



PADDLE MAGNET



EXPOSURE CALCULATOR



FILM IMAGE SCALES

LEAD LETTERS & FIGURES

- 100 Figures per package
- Available in flat face and deep block

Item No. TO-6051

Red Case for Lead Figures

8 in x 12 in (20.32 cm x 30.48 cm)

Item No. 9132901002

SENTINEL™ Lead Letters & Figures

Item No. R-1

SENTINEL™ Lead Letters (50 Each) with Case

Item No. R-50

MAGNETIC FILM HOLDER

- 50 lb Pull magnet attached through a steel spring arc
- Useful for curved ferrous based surfaces

Item No. 91340203

PADDLE MAGNET

- High impact plastic
- Ring magnet attached to 3 in x 4 in (7.62 cm x 10.16 cm) plastic flap

Item No. MAG003

RADIOGRAPHIC EXPOSURE CALCULATORS

Cobalt-60 & Iridium-192 Exposure Calculator with Leather Case

Item No. 534

Cobalt-60 & Iridium-192 Cardboard Exposure Calculator

Item No. 752

Radiation Safety Calculator

Item No. CAL001

FILM IMAGE SCALES

Transparent scales designed to assist in the sizing of linear and rounded material discontinuities

Film Image Scale, 1-IND

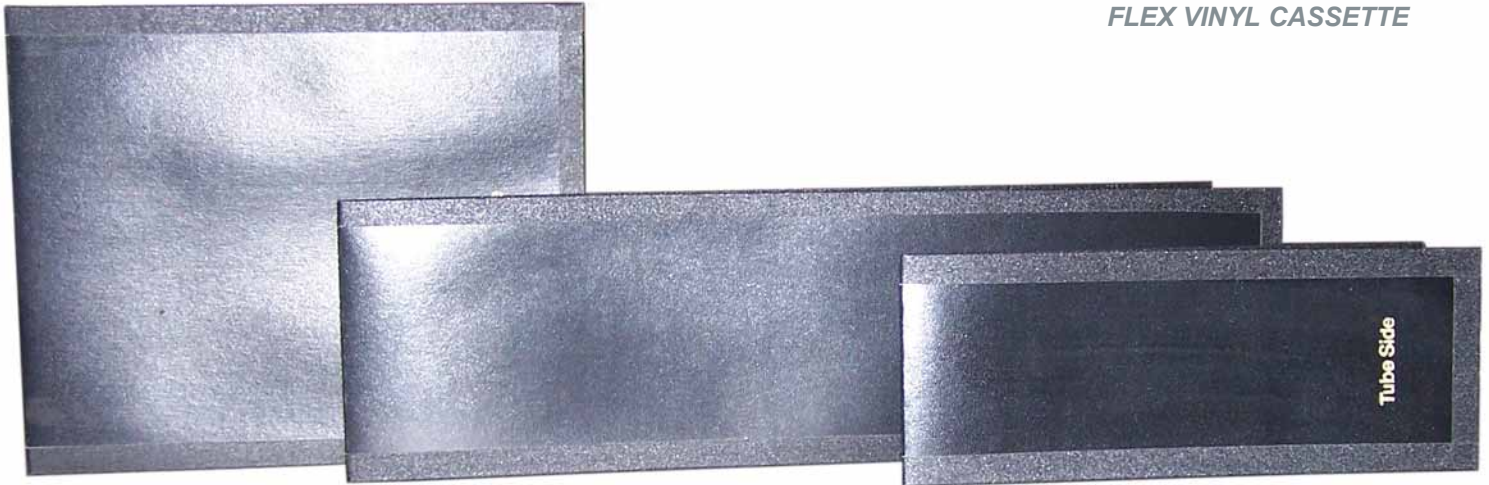
Item No. SCALE001

Film Image Scale, 1-PL

Item No. SCALE002

DARK ROOMS & EQUIPMENT

Exposure Accessories



FLEX VINYL CASSETTE

FILM CASSETTES

DESCRIPTION	SIZE	ITEM NO.
Cloth Belting	2.76 in (70 mm)	9133020096
	3.54 in (90 mm)	91330209
	4.5 in (114.30 mm)	91330210
Flex Vinyl	2.76 in x 10 in (70 mm x 25.40 cm)	9133010175
	2.76 in x 17 in (70 mm x 43.18 cm)	9133010176
	3.5 in x 10 in (8.89 cm x 25.40 cm)	9133010169
	3.5 in x 17 in (8.89 cm x 43.18 cm)	9133010166
	4.5 in x 10 in (11.43 cm x 25.40 cm)	9133010162
	4.5 in x 17 in (11.43 cm x 43.18 cm)	9133010158
	5 in x 7 in (12.70 cm x 17.78 cm)	9133010153
	7 in x 17 in (17.78 cm x 43.18 cm)	9133010144
	8 in x 10 in (20.32 cm x 25.40 cm)	9133010137
	10 in x 12 in (25.40 cm x 30.48 cm)	9133010127
Canvas Magnetic	14 in x 17 in (35.56 cm x 43.18 cm)	9133010111
	4.5 in x 10 in (11.43 cm x 25.40 cm)	TO-1238
	4.5 in x 17 in (11.43 cm x 43.18 cm)	TO-1239
	7 in x 17 in (17.78 cm x 43.18 cm)	TO-1241

DARK ROOMS & EQUIPMENT

Exposure Accessories

PLAQUE STYLE PENETRAMETERS

- Rigidly conform to specifications and code requirements
- Lead figures identify the penetrometer size
- Chemical etchings identify the penetrometer material

Item No. TO-0600

Penetrometer case, set A

Item No. 913100090

Penetrometer case, set B

Item No. 913100091

PENETRAMEETER CASE

MATERIAL GROUPS	SPECIFICATION	SIZE
Group A	ASMEV	#5 through #50
Aluminum	ASTM	#52 through #100
Steel	AWS	
Stainless Steel	API	.06 in through 2.5 in (1.52 mm through 63.5 mm)
Group B	MIL-453	2.6 in through 5.0 in
Aluminum Bronze	NAVSHIPS	(66.04 mm through 12.7 cm)
Brass		
Copper		
Cupro-Nickel		
Inconel		
Magnesium		
Monel		
Nickel		
Phosphor-Bronze		
Titanium		

WHEN ORDERING PLEASE SPECIFY

- Material group
- Specification

STEP WEDGES

- Used for the calibration of x-ray machines and evaluation of techniques
- Available with 4, 8 or 16 steps

MATERIAL	SIZE
Aluminum	4 Step
Steel	8 Step
Stainless Steel	16 Step
Magnesium	
Brass	
Cupro-Nickel	

3/4 in X 2 in SHIMS

- Used under penetrameters to compensate for thickness
- Available in 1/16 in. increments from 1/16 in. through 1 in.
- Allow 1/8 in. clearance
- Material and size information marked on each shim

ASTM E-747 WIRE STYLE PENETRAMEETERS

- Encapsulated in vinyl for durability
- Available in steel, stainless steel, aluminum and copper
- Available in three styles and sizes

Item No. TO-0600

SET B, STYLE 1

SETS	THICKNESS RANGE	WIRE LENGTH
Set A	.25 in through .75 in (6.35 mm through 19.05 mm)	1.3125 in (3.33 cm) 2 in (5.08 cm) 3 in (7.62 cm)
Set B	.75 in through 1.7 in (19.05 mm through 43.18 mm)	1.3125 in (3.33 cm) 2 in (5.08 cm) 3 in (7.62 cm)
Set C	1.7 in through 4.0 in (43.18 mm through 101.6 mm)	1.3125 in (3.33 cm) 2 in (5.08 cm) 3 in (7.62 cm)

MATERIAL	SIZE
Aluminum	.015 in through .05 in
Steel	(.38 mm through 1.27 mm)
Stainless Steel	.06 in through .25 in
Magnesium	(1.52 mm through 6.35 mm)
Brass	.31 in through .50 in
Copper	(7.87 mm through 12.7 mm)
Titanium	.56 in through 1.0 in
Cupro-Nickel	(14.22 mm through 25.44 mm)

DIGITAL IMAGING SYSTEM

SENTINEL™ VISION HR



Scan X® DISCOVER HR SCANNER

HARDWARE

The SENTINEL™ VISION HR is the lightest, most portable and rugged digital imaging system available. Imaging plates may be optionally erased in a single continuous cycle by the patented in-line erase feature. SENTINEL™ VISION HR accepts all brands of phosphor storage plates (PSPs) in all standard sizes up to 14" wide by any practical length and shape.

Engineering innovations put SENTINEL™ VISION HR ahead of the pack when it comes to rugged portability. Soft and hard cases are available, and a built-in rechargeable battery option and DC power adapter enable operation in virtually any setting.

Features

- Portable, lightweight & durable
- Easy to use
- Patented in-line erase
- Works with x-ray, Yb-169, Se-75, Ir-192 and Co-60
- Simultaneous multiple image plate scanning
- Optional built-in rechargeable battery
- Small laser spot size for high resolution imaging

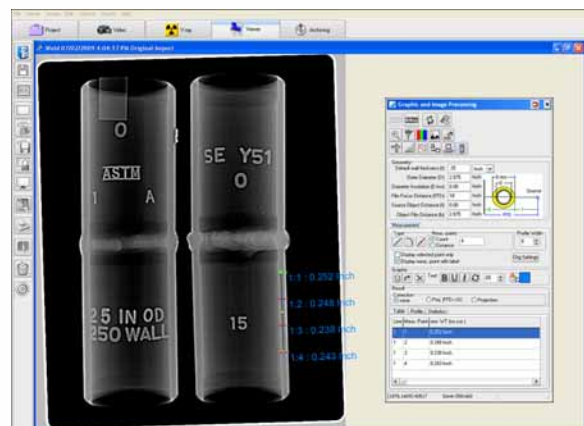
SOFTWARE

Digital images provide vastly more detail than traditional film. Sophisticated imaging software also allows you to take advantage of the wider latitude offered by PSPs.

Using SENTINEL™ VISION HR software, images can be magnified, inverted, sharpened and enlarged. SENTINEL™ VISION HR software incorporates user-friendly, advanced imaging tools. In the viewing software, automatic filters increase detail at the click of a mouse. Automatic presets can be established in order to increase productivity, while easy-to-use manual controls are always available for fine-tuning.

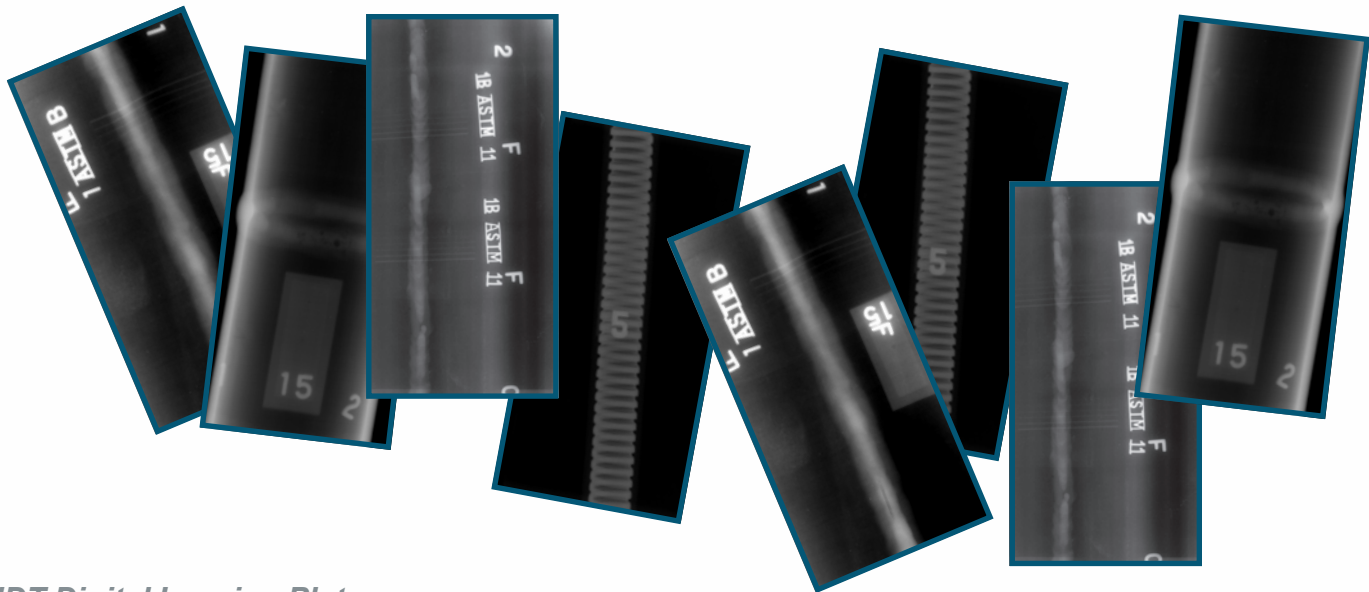
Comprehensive tools for pipe wall thickness measurement provide quantitative data for corrosion analysis. Additionally, the region of interest tool automatically adjusts brightness and contrast based on an easily-defined region.

User-definable and searchable information fields simplify image categorization and archiving. Additionally, archived images are automatically tagged for easy retrieval from networks or optical storage devices.



DIGITAL IMAGING SYSTEM

DIGITAL IMAGING PLATES



NDT Digital Imaging Plates

Digital Imaging Plates, also known as Phosphor Storage Plates (PSPs), offer the flexibility of film without the need for chemical processing. High resolution (HR) and general purpose (GP) plates are versatile and available in a wide variety of sizes.

When using digital imaging plates in conjunction with SENTINEL™ VISION HR system, images can be magnified, inverted, sharpened and enlarged.

Imaging plates may be optionally erased in a single continuous cycle by the patented in-line erase feature.

SENTINEL™ VISION HR software

incorporates a variety of user-friendly, advanced imaging tools.

FEATURES

- Flexible
- Sharp
- Versatile
- Efficient

GP DIGITAL IMAGING PLATES

SIZE	ITEM NO.
4.5 in x 10 in (11 cm x 25 cm)	1004266
4.5 in x 17 in (11 cm x 43 cm)	8584534
5 in x 7 in (13 cm x 18 cm)	1880723
7 in x 17 in (18 cm x 43 cm)	1355478
8 in x 10 in (20 cm x 25 cm)	8520454
10 in x 12 in (25 cm x 30 cm)	8640344
14 in x 17 in (35 cm x 43 cm)	1008564

HR DIGITAL IMAGING PLATES

SIZE	ITEM NO.
4.5 in x 10 in (11 cm x 25 cm)	1680214
4.5 in x 17 in (11 cm x 43 cm)	1466945
5 in x 7 in (13 cm x 18 cm)	8491615
7 in x 17 in (18 cm x 43 cm)	1848688
8 in x 10 in (20 cm x 25 cm)	1775576
10 in x 12 in (25 cm x 30 cm)	1174424
14 in x 17 in (35 cm x 43 cm)	8360521

Other sizes may be available upon request.

PORTABLE VIDEO X-RAY



OpenVision™ LT-NDT

OpenVision™ LT-NDT is a light weight portable x-ray system for hand-held inspection. It includes a highly sensitive x-ray imager and battery-operated 70kV x-ray tube designed for portable field operation. This unit's 4" x 6" imaging area and real-time video allows the operator to quickly scan a range of specimen and pipe sizes. Moving the x-ray source provides a 3D perspective, and moving closer or farther from the specimen allows for increased detail resolution or field of view. Images are presented on a high-resolution 7" LCD display or on a heads-up display mounted to a hard hat. A DV SD card recorder can be attached to the system to store the video image or capture still images.

70kV OpenVision™ LT-NDT
Item No. **OVLT-NDT-70**

OpenVision™ is a trademark of
Envision Product Design, LLC



TECHNICAL SPECIFICATIONS

	DESCRIPTION
Imaging Area	4 in x 6 in field of view (10.16 cm x 15.24 cm) field of view
Dimensions	13 in to 27 in X-ray tube to imager (33.02 cm to 68.58 cm) X-ray tube to imager 17 in throat depth (43.18 cm) throat depth
Acquisition Time	Real-time NTSC video (30 frames per second)
Energy	40/55/70 kV, .1/.2/.3 mA
Spatial Resolution	250 micron (0.010 in)
Contrast Resolution	8 bit, 256 grayscale
Weight	C-arm including imager, X-ray tube, and D handle: 17 lbs (7.71kg) Controller including battery and shoulder strap: 6 lbs (2.72 kg)
Operating Temperature	-30° F to 120° F (-34° C to 49° C)
Display	LCD hand held or optional handle mount
Alternate Display	Digital video recorder with LCD display, 30GB hard drive, 4GB SD card, and USB for PC interface

SALES: 800-225-1383 or 225-751-5893 FAX: 225-751-8082

2-3

LIQUID PENETRANT INSPECTION



PENETRANTS & CLEANERS

Spotcheck Penetrants

CLEANER/REMOVER

DESCRIPTION	UNIT	MEAS.	ITEM NO.
SKC-S	Case	9-16 oz	9801120042
SKC-S	Ea.	1 gal	9801120046
SKC-S	Ea.	5 gal	9801120044

SOLVENT DEVELOPER

DESCRIPTION	UNIT	MEAS.	ITEM NO.
SKD-S2	Case	9-16 oz	9801120022
SKD-S2	Ea.	1 gal	9801120027
SKD-S2	Ea.	5 gal	9801120025

AQUEOUS DEVELOPER

DESCRIPTION	UNIT	MEAS.	ITEM NO.
ZP-5B	Ea.	25 lb	MX210061

PENETRANTS

DESCRIPTION	UNIT	MEAS.	ITEM NO.
SKL-SP PE	Case	9-16 oz	9801110002
SKL-SP PE	Ea.	1 gal	9801110005
SKL-SP PE	Ea.	5 gal	9801110007

WATER WASHABLE PENETRANTS

DESCRIPTION	UNIT	MEAS.	ITEM NO.
SKL-WP	Case	9-16 oz	9801130007
SKL-WP	Ea.	1 gal	9801130000
SKL-WP	Ea.	5 gal	9801130002

CLEANER/REMOVER HIGH FLASH

DESCRIPTION	UNIT	MEAS.	ITEM NO.
SKC-HF	Case	9-16 oz	9801110042
SKC-HF	Ea.	1 gal	9801110043
SKC-HF	Ea.	5 gal	9801110045

Zyglö Penetrants

DRY POWDER DEVELOPER

DESCRIPTION	UNIT	MEAS.	ITEM NO.
ZP-4B	Ea.	10 lb	98012105
ZP-4B	Ea.	20 lb	01332875

WATER SOLUBLE DEVELOPER

DESCRIPTION	UNIT	MEAS.	ITEM NO.
ZP-14A	Ea.	20 lb	9801210069
ZP-14A	Ea.	50 lb	98012114

LIPOPHILIC EMULSIFIER

DESCRIPTION	UNIT	MEAS.	ITEM NO.
ZE-4B	Ea.	5 gal	98012108
ZE-4B	Ea.	20 gal	9801210048

REMOVER

DESCRIPTION	UNIT	MEAS.	ITEM NO.
ZR-10B	Ea.	5 gal	98012109
ZR-10B	Ea.	20 gal	01362030

NON-AQUEOUS DEVELOPER

DESCRIPTION	UNIT	MEAS.	ITEM NO.
ZP-9F	Case	9-16 oz	9801210013
ZP-9F	Ea.	5 gal	01335440

WATER WASHABLE PENETRANTS

LEVEL	DESCRIPTION	MEAS.	ITEM NO.
1/2	ZL-15B	5 gal	01315940
1/2	ZL-15B	20 gal	9801210035
1	ZL-19	5 gal	01326340
1	ZL-19	20 gal	01326330
2	ZL-60D	9-16 oz	MX220055
2	ZL-60D	1 gal	01327235
2	ZL-60D	5 gal	98012106
2	ZL-60D	20 gal	9801210067
3	ZL-27A	9-16 oz	9801210065
3	ZL-27A	1 gal	01318735
3	ZL-27A	5 gal	98012111
3	ZL-27A	20 gal	9801210025
3	ZL-67	1 gal	01327435
3	ZL-67	5 gal	98012201
3	ZL-67	20 gal	98012101
4	ZL-56	5 gal	01326740
4	ZL-56	20 gal	01326730

POST EMULSIFIABLE PENETRANTS

LEVEL	DESCRIPTION	MEAS.	ITEM NO.
2	ZL-2C	5 gal	98012110
2	ZL-2C	20 gal	9801210021

MAGNETIC PARTICLE INSPECTION



MAGNETIC PARTICLE INSPECTION

Magnetic Particle Materials



WET METHOD

DESCRIPTION	UNIT	MEAS.	ITEM NO.
14 A Aqua-Glo MPI Bath	Case	12-12 oz	98012711
14A Powder	Ea.	1 lb	98012700
14A Powder	Ea.	20 lb	MX270022
14A Premix	Case	9-16 oz	9801310012
20B Powder	Ea.	15 lb	9801370033
20B Powder	Ea.	30 lb	9801370034
MG-410 Powder	Ea.	1 lb	98013030
MG-410 Powder	Ea.	10 lb	01019169
7C Black	Ea.	8 lb	9801370001
7HF Black Aerosol	Case	9-16oz	9801370005
9C Red	Ea.	8 lb	9801370011
9CM Red Bath	Case	9-16 oz	9801310002

OIL PETROLEUM VEHICLE

DESCRIPTION	UNIT	MEAS.	ITEM NO.
MX-MG Carrier II	Ea.	5 gal	9801310990
MX-MG Carrier II	Ea.	20 gal	9801310992

DRY METHOD

DESCRIPTION	UNIT	MEAS.	ITEM NO.
1 Gray Powder	Ea.	10 lb	9801350001
1 Gray Powder	Ea.	25 lb	9801350003
1 Gray Powder	Ea.	45 lb	98013501
8A Red Powder	Ea.	10 lb	9801350021
8A Red Powder	Ea.	25 lb	9801350023
8A Red Powder	Ea.	45 lb	9801350024
3A Black Powder	Ea.	10 lb	9801350010
3A Black Powder	Ea.	25 lb	98013502
3A Black Powder	Ea.	45 lb	9801350013

SPECIALTY PRODUCTS

DESCRIPTION	UNIT	MEAS.	ITEM NO.
White Contrast Paint	Case	9-16 oz	9801350056

MAGNETIC PARTICLE INSPECTION

Accessories

CALIBRATED INDICATOR



FIELD INDICATOR

- Rugged, pocket-size meter
- Indicates residual magnetism remaining after demagnetization

Item No. 9801390041

10 GAUSS CALIBRATED FIELD INDICATOR

- Highly accurate measurement of residual leakage field after demagnetization
- Accurate to ± 0.3 gauss
- Scale range of 10-0-10

Item No. 9801390044



POWDER SPRAY BULB

- Lightweight, easy-to-use spray bulb
- Cap removes for easy filling

Item No. 9801360051



14A CENTRIFUGE TUBE WITH STAND

14A CENTRIFUGE TUBE

- 100 ml Centrifuge tube
- 0 to 1.0 ml in 0.05 increments
- For use with 14A, 14AM, and 20B fluorescent materials

Item No. 9801390001

7C/9C CENTRIFUGE TUBE

- 100 ml
- 0 to 1.5 ml in 0.10 increments
- For use with 7C, 9C, and 9CM color contrast materials

Item No. 9801390003

MG-410 CENTRIFUGE TUBE

- 100 ml Centrifuge tube
- 0 to 0.2 ml in 0.01 increments
- For use with MG-410

Item No. 507923

CENTRIFUGE STAND

Safely holds centrifuge tubes

Item No. 9801390002

MAGNETIC PARTICLE INSPECTION

Accessories



CONTINUOUS METHOD TEST BLOCK

- Quick, convenient check for proper magnetizing technique on wet horizontal units
- Crack indication forms on test block if current flow and bath concentration are adequate

Item No. 9801390043



TOOL STEEL TEST RING

- Drilled holes simulate subsurface discontinuities
- Form surface indications at various magnetizing current levels

Item No. 9801390046



MAGNETIC PARTICLE TEST BAR

Contains coarse and fine artificial surface and subsurface defects in both directions

Item No. 9801390061



DOUBLE BRAIDED CONTACT PADS

- Heavy copper braid over neoprene base
- Flexible, provides contact over greater surface area
- Reversible

Contact Pad with clip

Clips over headstock of A-915 and MAG Series units

Item No. 9801390067

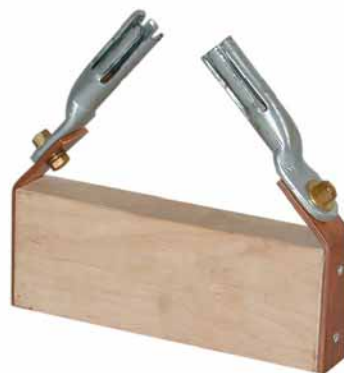
Contact Pad with v-block

Includes molded-in v-block for support and alignment

Item No. 18948

Replacement Pad

Item No. 9801390024



CONTACT BLOCK

- Supplies magnetizing current to remote prods or clamps
- Permits remote testing of parts

Item No. 1830

MAGNETIC PARTICLE INSPECTION

Yoke & Coil Kits

SENTINEL™ AC YOKE



SENTINEL™ MAGNETIC PARTICLE AC YOKE

- Yoke: AC 110/60Hz
- Leg Capacity: 0 to 8 in (0 to 20.32 cm)
- Cord: 13.12 ft (4 m)

AC Yoke

Item No. MP-A-2-S

AC Yoke with Light

Item No. MP-A-2L-S

SENTINEL™ DC YOKE



SENTINEL™ MAGNETIC PARTICLE DC YOKE

- Battery Powered
- Portable
- Removable Cord
- LED Battery Life Indicator
- Military Grade Connector
- Yoke: DC 12v
- Leg Capacity: 0 to 8 in (0 to 20.32 cm)

DC Yoke

Item No. MP-A-2D-S

Y-8 BATTERY POWERED DC YOKE KIT

Includes: Battery Powered Yoke, Charger, #1 Gray Dry Powder, Powder Spray Bulb

Item No. 98013112



Y-1 YOKE KIT

Y-1 AC YOKE KIT

Includes: Y-1 Yoke, #1 Gray Dry Powder, #8A Red Dry Powder, Scrubs, Powder Spray Bulb, Field Indicator, Paint Marker, Wiping Cloth and Instructions

Item No. 623529

Yoke only

Item No. 623502

Y-7 AC/DC YOKE KIT

Includes: Y-7 Yoke, #1 Gray Dry Powder, #8A Red Dry Powder, Scrubs, Powder Spray Bulb, Paint Marker, Wiping Cloth and Instructions

Item No. 9801310925

Yoke only

Item No. 9801310926

L-10 AC COIL



L-10 AC COIL KIT

Includes: L-10 Coil (115 Volt-50/60 Hz), 1 Lb. of #1 Gray Dry Powder, 1 #3A Black and #8A Red Dry Powder, 1 aerosol can of 7HF, 9CM and WCP-2, powder bulb, field indicator, 2 cans SKC-S and instructions

Item No. 98013111

Coil only

Item No. 9801310941

MAGNETIC PARTICLE INSPECTION

Prod Sets



STANDARD PROD SET

- Individual contact prods offer maximum flexibility in prod spacing and magnetizing of complex-shaped parts
- 3 PTL plug for P-Series portable power packs

Item No. 9801320013

Copper Prod Contact

Item No. 9801320068

Braided Prod Contact

Item No. 9801320071



DUAL HORIZONTAL PROD ASSEMBLY

- Offers one-person operation with variable prod spacing
- 3 PTL plug for P-Series portable power packs

Item No. 9801320023

DUAL IN-LINE PROD ASSEMBLY

- Offers one-person operation and variable prod spacing
- 3 PTL plug for P-Series portable power packs

Item No. 9801320042

BRAIDED CONVERSION ASSEMBLY

Converts solid tips to braid tips-two required

Item No. 186202

Cables & Connectors



REMOTE CONTROL CABLE

- 15 ft (4.57 m)
- Allows remote energization of portable power packs
- Standard 3 PTL plug

Item No. 9801320061

STANDARD 4/0 CABLE ASSEMBLIES

FITTINGS	LENGTH	ITEM NO.
Lug and eitherend	15 ft (4.57 m)	9801360043
Eitherends at both ends	15 ft (4.57 m)	11308
Lug and eitherend	20 ft (6.1 m)	9801360044
Eitherends at both ends	20 ft (6.1 m)	11314

4/0 LUG

Item No. 259040

4/0 EITHEREND CONNECTOR

Item No. 1238

EITHEREND LUG ADAPTOR

Item No. 9801390032

EITHEREND LUG ADAPTOR, 90°

Item No. 9801390033

MAGNETIC PARTICLE INSPECTION

Black Lights

ZB-100F BLACK LIGHT



ZB-100 BLACK LIGHT

- 100 watt black light with transformer, cords, GFCI and plug
- Tough aluminum housing
- Universal mounting

Item No. MX280000

ZB-100F BLACK LIGHT

- 100 watt black light with transformer, cords, GFCI and plug
- Built-in fan keeps light cool-to-the-touch
- Running temperature <85°F
- Recessed lens design
- Fiberglass-reinforced handle
- Tough aluminum housing

Item No. MX28000F

ZB-100F MB BLACK LIGHT

- Mag Shot Black Light
- Energize power packs from the ZB-100F MB
- 100 watt black light with transformer, cords, GFCI and plug
- Built-in fan keeps light cool-to-the-touch
- Running temperature <85°F
- Recessed lens design
- Remote button integrated into the handle
- Tough aluminum housing

Item No. 600086

ZB-150B FSB SELF BALLASTED BLACK LIGHT

- Built-in fan keeps light cool-to-the-touch
- 150 watt self-ballast bulb and 9.5 ft (2.9 m) power cord
- Fiberglass-reinforced handle

Item No. 9801290005

MAGNETIC PARTICLE INSPECTION

Black Light Accessories



DIGITAL WHITE LIGHT METER

- Accurately measures visible light by footcandles and lux
- Includes meter and white light meter sensor
- Calibrated for NDT use
- Includes battery and carrying case

Item No. 622338



DIGITAL BLACK LIGHT METER

- Accurate digital readout of black light intensity, tuned at 365 nanometers
- Includes meter and black light sensor
- Calibrated for NDT use
- Includes battery and carrying case

Item No. 622339



100 WATT MEDIUM BASE BULB
Replacement for ZB-100 and ZB-100F models

Item No. 9801290097



ZB-150 FSB BLACK LIGHT BULB
Replacement for ZB-150 model

Item No. 98012902



SMOOTH FILTER GLASS

For use with ZB-100 and ZB-100F models

Item No. 9801290092

Filter Assembly

Item No.25891

ZB-100 TRANSFORMER

Transformer with Case

Item No. 9801290094

BLACK LIGHT CARRYING CART

Item No. MX280001

PIPELINE CRAWLER SYSTEMS

10/60 X-RAY CRAWLER



X-Ray Crawler

JME Pipeline Crawlers are designed to produce high quality panoramic radiographs of circumferential butt welds in new pipelines from 3 to 72in (7.62 cm to 1.83m). These units are designed and proven, both onshore and offshore to work as a fully self contained, self powered exposure vehicle.

The Non Isotope Control System is a unique magnetic control system designed to replace the conventional isotope control system. There are no trailing leads and all commands are executed from outside the pipeline via magnetic transmitter (Magnetope).

Crawler tracking, so that the position and direction of the crawler can be monitored, is achieved either by mounting a low activity tracker isotope on the crawler or by using the non-isotope tracking system. The Non Isotope Tracking System is designed to comply with the increasing restrictions regarding the transportation and use of low level isotopes.

6/16 X-RAY CRAWLER

- Suitable for use in pipe diameters 6 to 16in
- X-ray tube options: CXT180

10/60 X-RAY CRAWLER

- Suitable for use in diameters 10 to 60in
- X-ray tube options: GFC160C, 200C, 300C, ICM250kV or ICM300kV

NON ISOTOPE CONTROL SYSTEM

- Suitable for use up to 20mm of steel thickness
- Accurate positioning and motion control
- Rechargeable
- For use with 6/16, 10/60, and 24/72

8/18 X-RAY CRAWLER

- Suitable for use in diameters 8 to 18in
- X-ray tube options: CXT180

24/72 X-RAY CRAWLER

- Suitable for use in diameters 24 to 72in
- X-ray tube options: GFC300C or ICM300kV

NON ISOTOPE TRACKING SYSTEM

- Eliminates need for tracker isotope
- Improved transportation safety
- Improved crawler handling safety

PORTABLE X-RAY GENERATORS

24/72 X-RAY CRAWLER



BALTOSPOT Crawler Series

The BALTOSPOT Crawler Series is comprised of x-ray generators varying in maximum capacity from 160 to 300kV. They are designed to be mounted on a mechanical carriage and produce high quality panoramic radiographs from within a pipeline. The generators are driven by an electronic circuit board that can be readily installed in the crawler body.

A crawler generator differs from a portable generator as it operates from a battery power supply. The GFC 200C and GFC 300C operate at a constant kV and mA regardless of battery cycle. Therefore, a stable dose output is achieved and image quality is consistent throughout the exposure time. The GFC 160C operates at a constant kV output while the tube mA decreases with battery cycles. Crawler endurance is improved by maintaining optimum exposure time regardless of battery discharge level.

- Portable
- Pulsed wave high voltage generator
- Energy saver

GFC 160C X-Ray Crawler Tubehead(160kV)

Item No. 0820647G

GFC 200C X-Ray Crawler Tubehead (200kV)

Item No. 0820608G

GFC 300C X-Ray Crawler Tubehead (300kV)

Item No. 0820609G

PORTABLE X-RAY GENERATORS

BALTOSPOT PANORAMIC X-RAY GENERATORS



BALTOSPOT Series

The BALTOSPOT Series is comprised of three divisions of directional and panoramic x-ray generators with varying specifications corresponding to different applications, field activities and budgets. These generators are light, rugged and reliable with a heavy duty cycle. They are designed for difficult on-site applications and fit for use with varying materials from aluminum to thick steel parts.

The CERAM X-Ray generators are pulsed wave units available in maximum capacities of 235 and 300kV. They are directional tubes which contain ceramic tubeheads with a copper external anode and a beryllium window.

The GF X-Ray generators are derived from the crawler series, but can be operated in the field without a mechanical carriage. Directional and panoramic units are available with maximum capacities of 160 to 300kV. They provide a reliable cost effective solution for price sensitive markets.

A crawler generator differs from a portable generator as it operates from a battery power supply. The GFC 200C and GFC 300C operate at a constant kV and mA regardless of battery cycle. The GFC 160C operates at a constant kV output while the tube mA decreases with battery cycles. Crawler endurance is improved by maintaining optimum exposure time regardless of battery discharge level.

COMPACT CONTROL DESK

The CF2000 compact control unit is connected directly to the x-ray generator. A water resistant keypad and robust design make the CF2000 perfect for industrial applications.

HAND X REMOTE CONTROL UNIT

The Hand X remote control unit is designed for comfort and safety in mind. The Hand X gives the operator full control of all of the generator's features from a safe distance. For added protection, an integrated dosimeter will alert the operator of the exact level of radiation in the area, and automatically shut down if the level exceeds the preset level.

PORTABLE X-RAY SYSTEMS

7.5 MeV PORTABLE X-RAY BETATRON



X-Ray Betatron

The JME Portable Betatron is a compact circular electron accelerator producing a high energy directional X-ray beam. Containing no moving parts except small airflow fans, and no circulating liquids, the Betatron is easy to assemble, operate and maintain. The Betatron also produces radiographs of very high contrast, sensitivity and resolution, meeting the tightest inspection standards.

- Portable
- Output energy selectable up to 7.5 MeV
- Excellent sensitivity and resolution
- Penetrates 11.81 in (300 mm) steel, 39.37 in (1m) concrete

2.5 MeV Portable X-Ray Betatron

Item No. PXB25

6 MeV Portable X-Ray Betatron

Item No. PXB6

7.5 MeV Portable X-Ray Betatron

Item No. PXB75

STATIONARY X-RAY SYSTEMS

BALTOGRAPH XSD GENERATORS



BALTOGRAPH Series

The BALTOGRAPH system is comprised of an x-ray generator, an LS1 control unit, and a TSD or TSC tubehead. The XSD generators are 19" racks, built around a sealed, oil and gas free, solid stage voltage multiplier. Surface Mount Device (SMD) electronics are used to minimize connections and reduce servicing time, size and weight.

The XSD generator is a high frequency constant potential stationary digital x-ray generator. Monopolar and Bipolar generators are available with maximum capacities of 160 to 450kV. The monopolar generator can achieve a maximum capacity of 225kV, while maintaining the flexibility to be a fixed or mobile installation. The bipolar generator can reach 450kV by combining two of the monopolar racks.

The XMD generator is the mobile version of the XSD. A robust cart has been designed to bring the powerful XSD to the inspection location. The cart can accommodate all of the accessories needed for the job including the closed circuit water cooling unit.

Both panoramic (TSC) and directional (TSD) tubeheads are available for the BALTOGRAPH system. All TSC and TSD tubeheads are equipped with standard bolted or quick lock flanges for easy tubehead replacement or mobile applications. Dual filaments provide the user with different focal spot sizes for an even wider range of applications.

LS1 CONTROL UNIT

The LS1 control unit, connected directly to the x-ray generator, provides all of the control and comfort options necessary to operate a BALTOGRAPH system. It is intelligent enough to display, retrieve, and record all of the exposure data collected. The LS1 incorporates all of the characteristics of the BALTOSPOT series into a compact, versatile control panel. An ergonomic ball navigator and 10 inch display allow for comfort and efficiency when selecting parameters and menus.

RADIATION SAFETY

Warning Tape & Signs



WARNING SIGNS

DESCRIPTION	SIZE	RADIATION AREA	HIGH RADIATION AREA	RADIOACTIVE MATERIAL
30 Gauge Steel	7 in x 10 in (17.8 cm x 25.4 cm)	9481311101	9481311201	9481311401
Lexan	7 in x 10 in (17.8 cm x 25.4 cm)	9481411101	9481411201	9481411401
Vinyl	7 in x 10 in (17.8 cm x 25.4 cm)	94818111	94818112	94818113



WARNING LABELS

- Cargo Aircraft Label
- 4-3/4 in x 4-5/16 in (12.7 cm x 10.95 cm)
- 500 per roll
- Item No. 4217002010**
- Class 7 Radioactive II Label
- 3.94 in x 3.94 in (100 mm x 100 mm)
- 500 per roll
- Item No. 4217002005**
- Class 7 Radioactive III Label
- Item No. 4217002006**



RADIATION AREA TAPE

STRIPED TAPE

BARRIER ROPE & TAPE

- Alternating Yellow and Magenta Stripe Tape
- 3/4 in x 150 ft (19.05 mm x 45.72 m)
- Item No. 9482000207**
- Alternating Yellow and Magenta Stripe Tape
- 2 in x 150 ft (5.08 cm x 45.72 m)
- Item No. 9482000208**

- Yellow and Magenta Durable Polypropylene Rope
- 5/16 in diameter (7.88 mm diameter)
- Item No. 9482000102**
- Radiation Area Tape
- 3 in x 1000 ft (7.62 cm x 304.8 m)
- Item No. 9482000209**

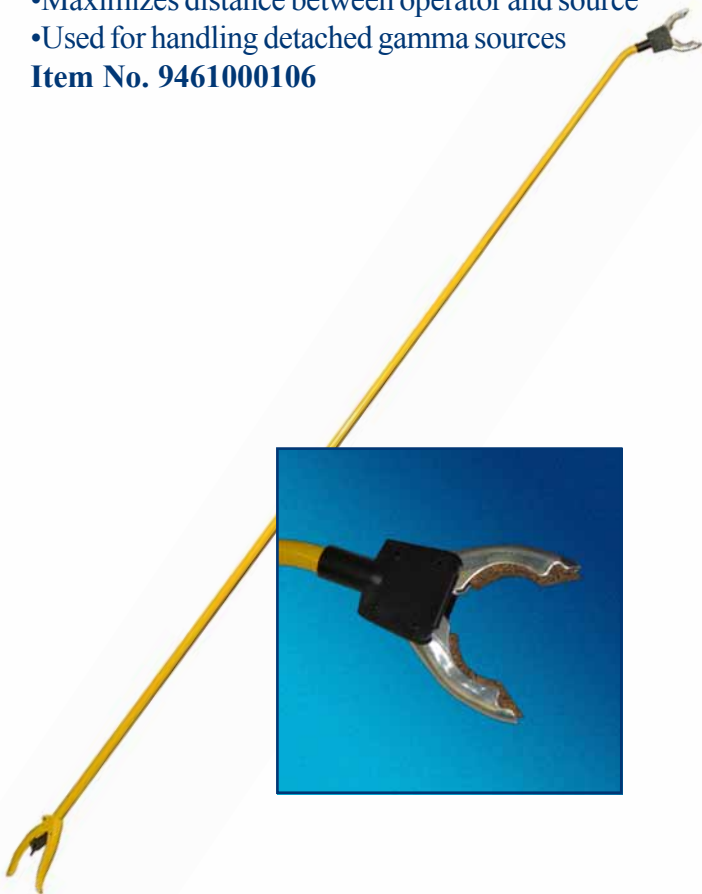
RADIATION SAFETY

Accessories

REMOTE HANDLING TONGS

- 6-1/2 ft (2 m)
- Emergency source retrieval
- Maximizes distance between operator and source
- Used for handling detached gamma sources

Item No. 9461000106



MANUALS

Radiation Safety Handbook

MAN-002

Case History of Radiographic Events

MAN-003

Working Safely in Gamma Radiography

MAN-005

660 Projector Operating and Maintenance Manual

MAN-006

741/680 Projector Manual

MAN-008

865 Projector Operating and Maintenance Manual

MAN-010

773 Calibrator Manual

MAN-011

650L Source Changer Manual

MAN-020

880 Projector Operating and Maintenance Manual

MAN027

959M SCAR Projector Manual

MAN033

979 SCAR Projector Manual

MAN036



EMERGENCY SOURCE STORAGE CONTAINER

Operation of the Safe Store storage container is intended for emergency use only in source retrieval situations. It will hold up to four sources with a total activity of 206 Ci, Ir-192. The shielding materials are lead and tungsten, so there is no depleted uranium liability.

The storage container comes complete with a lockable steel storage cage, restricting access to the inner storage pot. The cage reduces the surface dose rate on the container.

Item No. SAFESTORE

RADIATION SAFETY

Area Monitors



ND-AM MONITOR



ND-4000B MONITOR

ND-AM REMOTE AREA MONITOR

- 120V AC Dual range area monitor with selectable alarm trip points
- Radiography ranges: 0 to 50 and 0 to 500 mR/hr
- X-ray ranges: 0 to 5 and 0 to 50 mR/hr
- Two 120V AC remote alarm trip outlets

Item No. TANAM

ND-AM+

Includes Siren with 80 to 95 decibels at two feet

Item No. TANAM*

ND-AM1 Light

Portable red rotating warning light with stand and 25 ft (7.62 m) cable

Item No. TANAM1

ND-AM2 Light

Portable red rotating light with stand, siren, and 25 ft (7.62 m) cable

Item No. TANAM2

ND-AM3 Siren

Portable siren with stand and 25 ft (7.62 m) cable

Item No. TANAM3

ND-4000 AREA MONITOR

- Portable 12V DC area monitor with battery charger
- Standard trip point set at 2mR/hr
- Audio piezo alert
- Large red strobe warning light
- 12 in (H) x 10.8 in (W) x 8 in (D)
(30.48 cm (H) x 27.43 cm (W) x 20.32 cm (D))

Item No. TAN4000

ND-4000B AREA MONITOR

- Portable 120V AC hard wired or plug in area monitor
- Internal detector
- Non-adjustable trip point set at 2mR/hr
- Two 5 AMP 120V AC remote alarm outlets
- 9 in (H) x 8 in (W) x 5 in (D)
(22.86 cm (H) x 20.32 cm (W) x 12.70 cm (D))

Item No. TAN4000B

ND-4000BH

Hard wired only

Item No. TAN4000BH

ND-4000BL

Includes red rotating light

Item No. TAN4000BL

ND-4000BLA

Includes red rotating light and built in audio alarm

Item No. TAN4000BLA

RADIATION SAFETY

Survey Meters



ND-2000 SURVEY METER

ND-2000 SURVEY METER

- Rugged, watertight, dustproof radiographic survey meter
- Two piece nylon reinforced fiberglass case
- Large 3.5 in Mil-Spec meter indicator
- Meter face in both mR/hr and uSv/hr
- Three Ranges: 0 to 10, 0 to 100 and 0 to 1000 mR/hr
- 6.25 in (H) x 4.4 in (W) x 7.75 in (L)
(15.88 cm (H) x 11.18 cm (W) x 19.69 cm (L))

Item No. TAN2000

ND-2000A

Includes Audio

Item No. TAN2000A

ND-2000C

Includes Dosimeter Charger

Item No. TANC2000

ND-200P SURVEY METER

- Thin end window probe survey meter
- Two piece nylon reinforced fiberglass case
- Large 3.5 in Mil-Spec meter indicator
- Meter face in both mR/hr and CPM
- Four Ranges: 0 to 0.2, 0 to 2 and 0 to 200 mR/hr
- 8 in (H) x 4.4 in (W) x 7.75 in (L)
(20.32 cm (H) x 11.18 cm (W) x 19.69 cm (L))

Item No. TO-GES200P

Specialty survey meters are available upon request.

Personal Dosimetry



ND-138 DOSIMETER

- Direct gamma and x-ray dosimeter
- 0-200 mR Measuring range
- Temperature Range: -20° to 50° C
- 4.5 in (L) x 0.6 in (D)
(11.43 cm (L) x 1.52 cm (D))

Item No. TAN300

Leather Dosimeter Pouch

Item No. POU-001



RA-500 RATEMETER

- Die cast aluminum belt worn rate alarm
- Alarms at 500 mR ± 20%
- 24 Turn calibration potentiometer
- 2.5 in (W) x 4.25 in (L) x 1.25 in (D)
(6.35 cm (W) x 10.79 cm (L) x 3.18 cm (D))

Item No. TANRA500



ND-15 AUDIBLE ALARM

- Die cast aluminum belt worn alarm
- Dual range for continuous warning
- Alarm output is 100 decibels at 6 inches
- 2.5 in (W) x 4.25 in (L) x 1.25 in (D)
(6.35 cm (W) x 10.79 cm (L) x 3.18 cm (D))

Item No. TAN0132



ND-100 DOSIMETER CHARGER

- Direct reading dosimeter charger
- Compatible with all dosimeters
- Activated by contact with dosimeter
- 3.4 in (H) x 3.6 in (W) x 4.6 in (L)
(8.64 cm (H) x 9.14 cm (W) x 11.68 cm (L))

Item No. TAN100

RADIATION SAFETY

Personal Dosimetry

SENTINEL™ RADEYE G PORTABLE DOSE AND DOSE RATE METER



FEATURES

- Rugged and Reliable
- Nylon holster or optional see-through holster
- Removable rubber sleeve for extra protection
- Water resistant
- Low power technology (600 hour operation)
- LCD Screen can be rotated 180°
- Battery life indicator
- Large display with backlight
- Top alarm indication (Can be operated in holster)
- PC-software with real-time graph
- 1600 data points (Allows retrospective analysis)
- Adaptable user interface
- Earphone output for noisy environments
- Alarm relay output for area monitor applications

DEVICE SPECIFICATIONS

	DESCRIPTION
Radiation Type	Gamma and X-ray
Dimensions	3.8 in x 2.4 in x 1.2 in (96 mm x 61 mm x 31 mm)
Weight	5.64 oz (160 g)
Measuring Range	
Dose Rate	0.01 mR/h to 10 R/h (0.1 μSv/h to 100 mSv/h)
Dose	0.01 mR to 66 R (0.1 μSv to 66 mSv)
Energy Range	45 keV - 1.3 MeV
Linear Accuracy	± 10% within measurement range
Power Requirements	600 hour operation depending on mode
Batteries	2 AAA alkaline or rechargeable
Data Management	1600 data points (mean/max.)
Audible Alarm Intensity	>85 dB at a distance of 30 cm
Operating Temperature	-4° F to 122° F (-20° C to 50° C)

DIGITAL SURVEY METER

- Measuring range: 0.01 mR/h to 10 R/h
(0.1 μSv/h to 100 mSv/h)
- Overload indication: 10 R/h up to 1000 R/h
(100 mSv/h up to 10 Sv/h)
- Energy range: 45 keV-1.3MeV
- Energy compensated GM Tube

RATE ALARM

- Two programmable alarm thresholds for dose and dose rate
- Selectable anywhere from 0.01 mR/h to 9999 mR/h
- Audible, visual and vibrating alerts (Earphone optional)

ELECTRONIC PERSONAL DOSIMETER

- Displays accumulated personal dose
- Records mean/max dose rate
- Records accumulated dose
- PC-software for data analysis and instrument configuration (optional)
- Audible, visual and vibrating alerts (Earphone optional)

SOFTWARE

All settings and the data analysis can be done by an optional Windows™ based PC-software and an accompanying reader device.

RadEye G Gamma Survey Meter

Item No. 425067450

Holster

Item No. 425067046

Desktop Holder

Item No. 42506706001

PC Adapter Cable

Item No. 4254029

Earphone

Item No. 425067037

User Software (RadEye.Exe)

Item No. 425069951

Calibration Software (Cal-RadEye.Exe)

Item No. 425069952

RADIATION SAFETY

Survey Meter Calibration Devices

773 SURVEY METER CALIBRATOR

The Model 773 calibrator allows for the calibration of a survey instrument without changing its position. It permits the safe, accurate calibration of instruments used for surveying gamma radiation. The calibrator also enables users of dosage-measuring equipment to perform routine checks to meet the regulations of the N.R.C. and Agreement States.

The heavy-duty lead container holds 200 mCi (7.40 GBq) of Cesium-137 encapsulated at one end of a control rod. The source is exposed by raising the source rod. The reading is noted and recorded and the source is returned to the stored position. This reading is checked against the actual intensity.

A built-in tape measure helps determine the distance from the Cesium-137 source to the instrument being calibrated. A padlock prevents unauthorized use of equipment. And, a convenient handle is provided for carrying the calibrator.

Item No. TMN773



FEATURES

- Self-contained
- Safety
- Low surface dose rate (< 200 mR/h)
- Convenience
- Traceable
- Reliable manual operation
- Capability
- Lightweight

SPECIFICATIONS

DIMENSIONS			SOURCE CAPACITY
Length	5 in	(12.7 cm)	200 mCi (7.40 GBq), Cesium-137
Width	5 in	(12.7 cm)	
Height	8.5 in	(21.6 cm)	
Mass	53 lb	(24 kg)	

RADIATION SAFETY

Teletector Dose Rate Meter

TELETECTOR 6112M

The Teletector 6112M is a microprocessor controlled dose rate meter used to measure gamma radiation and detect beta radiation.

- Stainless steel telescope extendable up to 13 ft (4 m)
- Wide dose rate range with automatic range switching
- Illuminated LCD with analog and digital display
- Storage up to 450 records

ACCESSORIES

- Earphone
- PC Cable
- Data Processing Software
- Probe Cover
- Aluminum Case



TELETECTOR 6112M

- Energy Range: 45 keV to 1.3 MeV
- Dose Measurement Range: 1 μ R to 999 R
(10 μ Sv to 9.99 Sv)
- Dose-Rate Measurement Range: 1 μ R/h to 999 R/h
(10 μ Sv/h to 9.99 Sv/h)

Item No. NIGB9000

TELETECTOR 6150ADT

The Teletector 6150ADT consists of the dose rate meter 6150AD5/6 and the detachable Teletector Probe 6150AD-t. The 6150AD5 and 6150AD6 have different dose rate and energy ranges, and serves as the power supply for Teletector Probe 6150AD-t. Please ask for details when ordering.

- Stainless steel telescope extendable up to 13 ft (4 m)
- Wide dose rate range with automatic range switching
- Portable, hand held battery operated dose rate meter with robust waterproof aluminum die-cast housing

ACCESSORIES

- Probe Cover
- Aluminum Case



TELETECTOR 6150ADT

- Energy Range: 65 keV to 3 MeV
- Dose Measurement Range: 1 μ R to 999 R
(10 μ Sv to 9.99 Sv)
- Dose-Rate Measurement Range: 1 μ R/h to 999 R/h
(10 μ Sv/h to 9.99 Sv/h)

Item No. NIGB6240 (For 6150AD-t Teletector Probe)

Item No. NIGB6000 (For 6150AD5 Dose Rate Meter)

Item No. NIGB6001 (For 6150AD6 Dose Rate Meter)

Se-75 **SERVICES**

SOURCE PROJECTOR SERVICING

Your gamma radiography source projector should be regularly inspected and maintained. The U.S. Nuclear Regulatory Commission in 10 CFR 34.31 specifies that the licensee shall check for obvious defects in radiographic exposure devices, storage containers, and source changers prior to equipment use. Additionally, the licensee shall conduct a program or inspection and maintenance of radiographic exposure devices, storage container, and source changers at intervals not to exceed three months or prior to the first use thereafter. Inspection and maintenance records of these programs are to be kept for three years.

QSA Global, Inc. can provide inspection and maintenance service for source projectors that are sent to our Burlington or Baton Rouge facilities. The service includes:

- A complete inspection to check for any wear in moving components or safety interlocks
- Repainting and provision of new labels when appropriate
- Provision of a dated inspection and maintenance certificate

An inspection will normally be carried out during a source exchange at no extra cost, and we will inform you of any faults found and estimated cost to repair or service. Full service, maintenance and certification is only provided at your request and is available for any source projector sent to us whether loaded or empty.

SURVEY METER CALIBRATION

The U.S. Nuclear Regulatory Commission in 10 CFR 34.25 specifies that each radiation survey instrument shall be calibrated at intervals not to exceed six months. Also, after each instrument servicing, a record shall be maintained of the results of each instrument calibration and date thereof for three years after the date of calibration.

QSA Global, Inc. performs the survey meter calibrations at our Baton Rouge facility, and issues the appropriate calibration certificate. Any repairs or replacement parts would be charged extra at prevailing rates.

LEAK TESTING

The U.S. Nuclear Regulatory Commission in 10 CFR 34.27 states that each sealed source shall be tested for leakage at intervals not to exceed 6 months, and testing of 'S' tube devices is not to exceed 12 months. The leak test shall be capable of detecting the presence of 0.005 microcuries (5 nanocuries) of removable contamination.

QSA Global, Inc. provides a leak test kit which enables wipe tests to be obtained locally without the need to send the source/projector to a service facility. The kit contains full instructions and the consumables necessary for the test. Test samples are returned by mail to our service facilities for analysis and a report is mailed to the user.

EMERGENCY SERVICE

QSA Global, Inc. will provide qualified field technicians in the event of a radiological emergency. Personnel experienced in source retrieval and decontamination processes are available.

FIELD SERVICE

Our trained service technician will visit your facility or work-site to perform equipment inspection and maintenance. This is normally arranged as part of quarterly, biannual or annual maintenance of equipment. There is a minimum daily charge, plus expenses, replacement parts and reciprocity fees where applicable.

Disposition & Remediation

QSA Global, Inc. can provide all of the services needed for the disposition of your gamma radiography sources and materials. The service includes:

- Packaging your sources
- Leak testing of sealed sources
- D.O.T. approved shipping containers
- Preparation of dangerous goods forms
- Transportation of your sources and material
- Removal or unloading of sources
- Letter of receipt and possession for all sources and material



INDUSTRIAL RADIOGRAPHY SOURCES & EQUIPMENT

- Co-60
- Ir-192
- Se-75
- Yb-169
- Depleted Uranium Projectors
- Depleted Uranium Collimators



TRAINING COURSES & SEMINARS

**Contact Tara Insalaco for
Registration & Scheduling Information
Phone: 800-815-1383 Ext. 202 or 781-505-8202
Fax: 781-564-2702
tara.insalaco@qsa-global.com**

ADMINISTRATORS' SEMINAR

2 Days (16 Hours)

The seminar covers key aspects in the establishment and management of Isotope Radiography Programs to assure conformance to applicable regulations. Specific emphasis is placed on current, proposed and new regulations covering NRC, DOT, IAEA, and Agreement State Legislation.

INSPECTION & MAINTENANCE

2 Days (16 Hours)

The seminar covers design, approvals, QA requirements, daily inspections, formal inspections and maintenance of Isotope radiography systems. You will be trained to maintain and inspect Gamma Ray projectors and accessories that are essential per 10 CFR 34 and 10 CFR 71 QA requirements.

RADIATION SAFETY COURSE

5 Days (40 Hours)

The training covers the basics of radiation safety for industrial radiography that meets the requirements of 10 CFR 34.43 (g) and prepares the attendee for radiographer certification (ASNT-IRRSP-1A). Training includes practical sessions for survey instrument calibration, operation of exposure devices, conducting surveys, set-up of controlled areas, source exchanges, leak testing, daily inspections performed by radiography personnel and formal maintenance requirements.

RETRIEVAL COURSE

2-1/2 Days (24 Hours)

You will be trained to conduct or supervise the safe recovery of isotope radiography sources involved in accident or malfunction situations. The course covers cause and prevention, planning and assessment, exposure determination, shielding and operational guidelines. The course includes a half day lab session and a session for reporting and root cause determination.

TRAINING COURSES & SEMINARS

SENTINEL™ Course Registration Form

COURSE NAME _____

DATE REGISTERED _____

DATE OF COURSE _____

CONTACT NAME _____

TELEPHONE NO. _____

FAX NO. _____

COMPANY NAME _____

EMAIL ADDRESS _____

BILLING ADDRESS _____

STUDENT NAME(S) _____

MAILING ADDRESS _____

PAYMENT INFORMATION

PURCHASE ORDER NO. _____

CHECK NO. _____

Please submit registration by fax (781-564-2702) or email (tara.insalaco@qsa-global.com).

ULTRASONICS

SENTINEL™ Ultrasonic Thickness Gage

The SENTINEL™ Ultrasonic Thickness Gage is a portable, digital, hand-held unit specifically designed to measure the remaining wall thickness of primarily steel structures.

DEVICE SPECIFICATIONS

	DESCRIPTION
Thickness Range	0.008 in to 20 in (.20 mm to 508 mm)
Delay line zero measurement	Auto at power up with listed numeric value
Scan Mode	Displays minimum or maximum thickness value at 20 measurements per second
Hold Mode	Holds display to retain last thickness reading
Freeze Mode	Freezes display
Units	Inches/Millimeters/Microseconds
Bandwidth	0.5 MHz to 20 MHz (-3dB)
Gain	Low, Standard or High
Batteries	2 AA alkaline batteries (up to 200 hours)
Differential Mode	Displays the difference from the actual thickness measurement and a user entered reference value
Alarms	Minimum/Maximum depth, vibralarm, beeps and display flashes as well as keypad illumination and vibration
Illuminating Keypad	F1=Red, F2=Yellow, F3=Green
Transducer Attendant	Automatically informs operator to replace the transducer
Echo to Echo	Measures the metal thickness only
Non-Encoded B-Scan	Displays a cross section of the test piece
Dimensions	5 in x 3 in x 1.25 in (127 mm x 76.2 mm x 31.75 mm)
Weight	8 oz (.23 kg)
Operating Temperature	-4° F to 122° F (-20° C to 50° C)



SHC-09B

The most economical thickness gage designed to make reliable, accurate thickness readings on mostly steel structures with access to only one side.

- Simple user interface
- Easily upgraded to SHC-09 or SHC-09DL

Item No. SHC-09B

SHC-09

The mid-range model combines most commonly used features in a thickness gage not requiring a datalogger.

- Increase or decrease gain
- Vibrate and illuminate the keypad
- Transducer attendant
- Easily upgraded to SHC-09DL

Item No. SHC-09

SHC-09DL

In addition to all of the features of the SHC-09, the premium model also offers :

- Flexible datalogger
- B-Scan
- Echo to Echo
- Carrying pouch

Item No. SHC-09DL

SENTINEL™ ULTRASONICS



FEATURES

- Live simultaneous color waveform and thickness display
- Dynamic waveform color change on alarm
- Control of gain, blanking, range, RF and rectify modes
- Available in multiple models

SHC-09C

Item No. SHC-09C

SHC-09CW

Item No. SHC-09CW

SHC-09DLCW

Item No. SHC-09DLCW

SENTINEL™ Waveform Ultrasonic Thickness Gage

The SENTINEL™ Waveform Ultrasonic Thickness Gage is the smallest ultrasonic thickness gage with high resolution color waveform display. Unique features include live color A-Scan and B-Scan, 50K thickness reading (5000 waveforms) datalogger with interface program, vibration and color change of waveform on alarm.

Auto range centers echoes in the middle of the screen independent of material thickness. The blanking and gain adjustments are ideal for complete waveform adjustment and control. The echo to echo feature can ignore the paint or coating thickness. The waveform option can even be added to our popular SHC-09 gages.

DEVICE SPECIFICATIONS

	DESCRIPTION
Thickness Range	0.008 in to 20 in (.20 mm to 508 mm)
Delay line zero measurement	Auto at power up with listed numeric value
Scan Mode	Displays minimum or maximum thickness value at 20 measurements per second
Batteries	2 AA alkaline batteries (up to 200 hours)
Differential Mode	Displays the difference from the actual thickness measurement and a user entered reference value
Alarms	Minimum/Maximum depth, vibralarm, beeps and display flashes as well as keypad illumination and vibration
Illuminating Keypad	F1=Red, F2=Yellow, F3=Green
Transducer Attendant	Automatically informs operator to replace the transducer
Gain Adjust	Variable adjustment of gain
Range	Adjustment of manual range control or auto zoom tracking to center echoes independent of selected range
Rectification Modes	RF, Half Wave Positive, Half Wave Negative and Full Wave Rectification
Waveform	Live Color Waveform
Echo to Echo	Measures the metal thickness only
Non-Encoded B-Scan	Displays a cross section of the test piece
Dimensions	5 in x 3 in x 1.25 in (127 mm x 76.2 mm x 31.75 mm)
Weight	8 oz (.23 kg)
Operating Temperature	-4° F to 122° F (-20° C to 50° C)

